

REMARKS

This amendment is responsive to the Final Office Action of February 2, 2009. Reconsideration and allowance of claims 1, 3-5, 9, 12, 18, and 21-31 are requested.

The Office Action

Claims 9, 22, 24, 27, and 29 stand rejected under 35 U.S.C. §112, first paragraph (written description).

Claims 1, 18, 21, 22, 24-26, 28, and 30-32 stand rejected under 35 U.S.C. §112, second paragraph.

Claims 1-4, 9, 18, 21-28, and 30-32 stand rejected under 35 U.S.C. § 103 over Seeley (US 6,484,049) in view of Simon (US 6,118,845).

Claim 5 stands rejected under 35 U.S.C. § 103 over Seeley in view of Simon, further in view of Erbel (US2002/0122530).

Claims 12 and 29 stand rejected under 35 U.S.C. § 103 over Seeley in view of Simon, further in view of Ogawa (US 5,572,251).

The Present Amendment Should Be Entered

The present amendment should be entered as reducing the issues on appeal or as placing the application in condition for allowance. The present amendment makes minor wording changes to substitute language from the specification for the claim language to which the Examiner objected under 35 U.S.C. § 112, first paragraph, in most cases using the exact language which the Examiner suggested. The present amendment also addresses the 35 U.S.C. § 112, second paragraph, antecedent basis issues raised by the Examiner.

Because the present amendment eliminates the 35 U.S.C. § 112, first paragraph, issues and the 35 U.S.C. § 112, second paragraph, antecedent basis issues, it is submitted that the present amendment should at least be entered as reducing the issues on appeal.

Telephone Interview Summary

The Applicant expresses appreciation to Examiner Zeilberger for the courtesy of a telephone interview on March 23, 2009. At the interview, amendments to the wording of the claims were discussed to distinguish more clearly over the references. No agreement was reached. The present amendment further amends the claims along the lines suggested by the Examiner.

35 U.S.C. § 112, First Paragraph

Claim 9: the Applicant has amended line 11 to change “radiotranslucent sheet” to “transparent carrier” which finds antecedent basis at page 4, line 32. “Transparent” is defined at page 4, line 34 – page 5, line 2.

Claim 22: the Applicant has changed the language to which the Examiner objected to the language which the Examiner suggested. This change also necessitated an amendment to line 6 to provide proper antecedent basis to the language suggested by the Examiner.

Claim 24: the language “a mechanically flexible radiotranslucent layer” has been changed to “an x-ray transparent carrier”. This language finds antecedent basis on page 4, line 32 – page 5, line 2.

Claim 27: the language to which the Examiner objected in claim 27 is substantially the same as in claim 22. Accordingly, claim 27 has been amended like claim 22.

Claim 29: Claim 29 has been amended to delete “N” and replace it with a more general plurality of absorption levels and multi-valent.

It is submitted that these amendments bring the application fully into compliance with 35 U.S.C. § 112, first paragraph, without changing the meaning, as understood from the Office Action, that the Examiner was applying to these claims. Accordingly, it is submitted that this amendment should be entered as reducing the issues on appeal.

35 U.S.C. § 112, Second Paragraph (Antecedent Basis)

The applicant has amended **claim 1** and all of the claims which depend therefrom to call consistently for a “reconstructed diagnostic image”.

Claim 24 has been amended to cure the language inconsistency noted by the Examiner.

Claims 25 and 26 have been amended to call for the “x-ray image” for consistency with parent claim 9.

Claim 28 has been amended to correct the grammatical inconsistency. In making the corrections under 35 U.S.C. § 112, first paragraph, care has been taken to use the replacement language consistently.

Claim 30 and claims 31 and 32 dependent therefrom have been amended to refer consistently to the “generated diagnostic image”.

Because these amendments cure wording inconsistencies which led to antecedent basis issues, and because it is understood from the Office Action that these amendments do not change how the Examiner was interpreting these claims, it is submitted that these amendments should be entered as resolving 35 U.S.C. § 112, second paragraph, issues without raising issues that would require further search or consideration.

Individually Not Visibly Evident

First, the Applicant refers the Examiner to the “Background Discussion” on page 7 of Amendment D.

In response to the Examiner’s arguments in paragraph 4 starting on page 4, the applicant would like to point out that the Examiner has not addressed the word “individually”. Indeed, as explained in the present application, the individual elements are not detectable. However, all of the locations elements of the pattern, (but not the individual elements themselves) taken together, are determinable. As the present application points out at page 2, lines 18-21, not visible means that during evaluation of the image, the marking elements, each considered *per se*, are not detectable or distinguishable from the remaining image content. As further pointed out at page 4, lines 12-14, the individual marking elements cannot be detected either visually or by automatic analysis methods without knowledge of the original pattern.

As pointed out on page 3, lines 1-4, even though the individual marking elements are not visible in the image and cannot be localized, by knowing the pattern comprising multiple marking elements enables the common localization of all or a multiple of the marking elements with the aid of a suitable analysis method. Page 3, lines 5-13 summarize a suitable analysis method which is described in greater detail starting at page 7, line 25. One reason why the individual elements cannot be seen is pointed out page 7, lines 21-24, i.e., they are concealed even under the most unfavorable conditions of system noise. Thought of another way, the elements add a small amount of additional attenuation or gray scale to the corresponding pixel, but the small amount is so small that it is less than the normal error or uncertainty due to noise.

Once the pattern in the x-ray image is correlated with the filter image, then one knows the point P in the image which corresponds to the center of the pattern (page 9, lines 10-11). Note that there may or may not be a detector element at this location. Indeed, because the center of an image is generally the region of interest and because the marking elements are placed predominantly outside of the region of primary interest, it is likely that there is no marking element at point P.

Once one knows the center and orientation of the mask image M, one knows the location of the marking elements in the image. However, even once one knows the location of the marking element in the image, one still cannot see the individual marking elements because they are buried in the image noise.

In this manner, the location of a pattern of marking elements, each of which individually is not visible, can be determined.

Accordingly, it is submitted that claim 1 and claims 3-5, 18, and 21-24 dependent therefrom comply with the requirements of 35 U.S.C. § 112, first paragraph.

35 U.S.C. § 112, First Paragraph

In claim 30, the phrase that “individual marking elements are not visibly evident in the generated image to a computer pattern recognition routine” is accurate and coincides with the specification. As discussed above in conjunction with claim 1, the system and method described in the specification repeatedly states that the marking elements are not individually visibly evident, but taken together, rather

than individually, as a pattern, the pattern is detectable. Accordingly, for the reasons set forth above, it is submitted that this phrase is an accurate description of the method described in the specification.

**The Claims Distinguish Patentably
Over the References of Record**

With reference to **claim 1**, it is submitted that when claim 1 is interpreted as requiring the marking elements to be individually not visibly evident or individually not detectable, then the claim is being properly interpreted and is supported by the specification. In Seeley, the individual marking elements are detectable or visible to a computer system or a human viewer. Simon is not cited as and does not cure this shortcoming of Seeley. Accordingly, it is submitted that **claim 1 and claims 3-5, 18, and 21-24 dependent therefrom** distinguish patentably and unobviously over the references of record.

Claim 9 calls for the effect of the individual marking elements to lie within a noise level of the x-ray image. When marking elements lie within the noise level, individual marking elements cannot be distinguished from noise in the image. As the Examiner correctly concedes, Seeley does not show this limitation. Simon does not cure this shortcoming. Simon merely discloses subtracting an offset, which offset is equal to the intensity of the image of the calibration marker taken alone and in which there is no anatomical or other material visible (column 7, lines 5-19). Thus, Simon specifically requires the marker to be visible and above the noise level so that it can be detected. The section of Simon referenced by the Examiner makes no suggestion of using a marker which is within a noise level. Accordingly, it is submitted that **claim 9 and claims 12 and 25-29 dependent therefrom** distinguish patentably and unobviously over the references of record.

Claim 30 calls for the marking elements to alter the gray scale of corresponding pixels of the generated diagnostic image to such a small degree that the individual marking elements are not visually evident in the generated image to a computer pattern recognition routine. By contrast, as understood from the Examiner's explanation of the 35 U.S.C. § 112, first paragraph rejection, the Examiner is interpreting this language of claim 30 to mean just the opposite, i.e., that the individual marking elements are visible, albeit to a limited extent, in the diagnostic

image. Because the marking elements of Seeley and Simon are individually visible in the diagnostic image, it is submitted that **claim 30** and **claim 31 dependent therefrom** distinguish patentably and unobviously over the references of record.

CONCLUSION

For the reasons set forth above, it is submitted that claims 1, 3-5, 9, 12, 18, and 21-31 distinguish patentably and unobviously over the references of record. An early allowance of all claims is requested.

Respectfully submitted,

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